What is claimed is:

[Claim 1] A method of manufacturing a fluid dynamic bearing, the fluid dynamic bearing having:

a shaft base having a flat surface on one side thereof;

a shaft erected on one side of the shaft base and having a cylindrical outer peripheral surface;

a sleeve member rotatably supported on and relatively to the shaft, the sleeve member including an inner peripheral surface in radially opposed relation to the outer peripheral surface of the shaft and an axial end surface in axially opposed relation to the flat surface, the sleeve member being fitted on the shaft;

a cylindrical peripheral wall erected on one side of the shaft base in such a manner as to surround the radially outer part of the sleeve member; and

an annular cover member having an inner peripheral edge smaller in diameter than the inner peripheral surface of the cylindrical peripheral wall, the cover member being mounted on the cylindrical peripheral wall;

wherein at least a part of the gap between the outer peripheral surface of the shaft and the inner peripheral surface of the sleeve member which are in radially opposed relation to each other is secured as a minuscule radial bearing gap filled with the lubricating oil;

the radial dynamic bearing is made up of the outer peripheral surface of the shaft, the inner peripheral surface of the sleeve and the radial bearing gap; and

the flat surface of the shaft base plate member and the axial end surface of the sleeve member are in axially opposed relation to each other, and at least partially filled with the lubricating oil;

the manufacturing method comprising:

a first step to hold the lubricating oil in at least a part of said radial gap and said axial gap, in which the interface between the lubricating oil and the atmosphere is formed between the cylindrical peripheral wall and the outer peripheral surface of the sleeve member; and

a second step to locate, after the first step, an axial end surface of the cover member being apart from the interface in axial direction, and to fixedly weld the cover member by radiating a directive energy beam on said cylindrical peripheral wall.

[Claim 2] A method of manufacturing a fluid dynamic bearing according to claim 1,

wherein at least a part of the gap between the flat surface of said shaft base member and the axial end surface of said sleeve member which are in axially opposed relation to each other is secured as a minuscule thrust bearing gap filled with the lubricating oil, and

said flat surface of said shaft base member, the axial end surface of said sleeve member and said thrust bearing gap make up a thrust dynamic bearing.

[Claim 3] A method of manufacturing a fluid dynamic bearing according to claim 1, further comprising, before said second step, a third step for fixedly fitting the radiator on the outer peripheral surface of said cylindrical peripheral wall.

[Claim 4] A method of manufacturing a fluid dynamic bearing according to claim 1, further comprising, in and immediately after said second step, a fourth step for supplying the cooling fluid to the weld zone and the neighborhood thereof.

[Claim 5] A method of manufacturing a fluid dynamic bearing according to claim 3, further comprising, in and immediately after said second step, a fourth step for supplying the cooling fluid to the weld zone and the neighborhood thereof.

[Claim 6] A method of manufacturing a fluid dynamic bearing according to claim 1, further comprising, after said first step but before said second step, a fifth step for confirming the position of said interface.

[Claim 7] A method of manufacturing a fluid dynamic bearing according to claim 2, further comprising, after said first step but before said second step, a fifth step for confirming the position of said interface.

[Claim 8] A method of manufacturing a fluid dynamic bearing according to claim 1,

wherein one axial side of the outer peripheral surface of said sleeve member has a larger diameter than the other axial side thereof, and the diameter of the inner peripheral edge of said cover member is smaller than the diameter of the other axial side of the outer peripheral surface of said sleeve member, and said shaft and said sleeve member attempting to come away from each other at least a predetermined distance in axial direction engage each other and function as a stopper.

[Claim 9] A method of manufacturing a fluid dynamic bearing according to claim 2,

wherein one axial side of the outer peripheral surface of said sleeve member has a larger diameter than the other axial side thereof, and the diameter of the inner peripheral edge of said cover member is smaller than the diameter of the other axial side of the outer peripheral surface of said sleeve member, and said shaft and said sleeve member attempting to come away from each other at least a predetermined distance in axial direction engage each other and function as a stopper.

[Claim 10] A method of manufacturing a fluid dynamic bearing according to claim 7,

wherein one axial side of the outer peripheral surface of said sleeve member has a larger diameter than the other axial side thereof, and the diameter of the inner peripheral edge of said cover member is smaller than the diameter of the other axial side of the outer peripheral surface of said sleeve member, and said shaft and said sleeve member attempting to come away from each other at least a predetermined distance in axial direction engage each other and function as a stopper.

[Claim 11] A method of manufacturing a fluid dynamic bearing according to claim 8, further comprising, before said second step, a sixth step for determining the position at which said cover member is fixed and provisionally fixing said cover member at said position.

[Claim 12] A method of manufacturing a fluid dynamic bearing according to claim 10, further comprising, before said second step, a sixth step for determining the position at which said cover member is fixed and provisionally fixing said cover member at said position.

[Claim 13] A method of manufacturing a fluid dynamic bearing according to claim 2,

wherein one axial end of the inner peripheral surface of said sleeve member is sealed and there is only one interface.

[Claim 14] A method of manufacturing a fluid dynamic bearing according to claim 7,

wherein one axial end of the inner peripheral surface of said sleeve member is sealed and there is only one interface.

[Claim 15] A method of manufacturing a fluid dynamic bearing according to claim 10,

wherein one axial end of the inner peripheral surface of said sleeve member is sealed and there is only one interface.

[Claim 16] A method of manufacturing a fluid dynamic bearing according to claim 1,

wherein said sleeve member includes a substantially cylindrical sleeve having an inner peripheral surface radially opposed to the outer peripheral surface of said shaft, and a bearing housing located radially outward of said sleeve and having said sleeve fitted therein.

[Claim 17] A method of manufacturing a fluid dynamic bearing according to claim 2,

wherein said sleeve member includes a substantially cylindrical sleeve having an inner peripheral surface radially opposed to the outer peripheral surface of said shaft, and a bearing housing located radially outward of said sleeve and having said sleeve fitted therein.

[Claim 18] A method of manufacturing a fluid dynamic bearing according to claim 15,

wherein said sleeve member includes a substantially cylindrical sleeve having an inner peripheral surface radially opposed to the outer peripheral surface of said shaft, and a bearing housing located radially outward of said sleeve and having said sleeve fitted therein.

[Claim 19] A method of manufacturing a fluid dynamic bearing according to claim 1,

wherein said cover member is fixedly welded on said cylindrical peripheral wall at a plurality of points along the outer peripheral edge of said cover member, and said weld zone is distributed along a circle symmetrically with respect to the center point of said cover member.

[Claim 20] A method of manufacturing a fluid dynamic bearing according to claim 5,

wherein said cover member is fixedly welded on said cylindrical peripheral wall at a plurality of points along the outer peripheral edge of said cover member, and said weld zone is distributed along a circle symmetrically with respect to the center point of said cover member.

[Claim 21] A method of manufacturing a fluid dynamic bearing according to claim 12,

wherein said cover member is fixedly welded on said cylindrical peripheral wall at a plurality of points along the outer peripheral edge of said cover member, and said weld zone is distributed along a circle symmetrically with respect to the center point of said cover member.

[Claim 22] A method of manufacturing a fluid dynamic bearing according to claim 1,

wherein said cover member is continuously welded peripherally along the outer peripheral edge thereof.

[Claim 23] A method of manufacturing a fluid dynamic bearing according to claim 5,

wherein said cover member is continuously welded peripherally along the outer peripheral edge thereof.

[Claim 24] A method of manufacturing a fluid dynamic bearing according to claim 12,

wherein said cover member is continuously welded peripherally along the outer peripheral edge thereof.

[Claim 25] A method of manufacturing a fluid dynamic bearing according to claim 15,

wherein said cover member is continuously welded peripherally along the outer peripheral edge thereof.

[Claim 26] A spindle motor for rotating a recording disk, comprising:

a fluid dynamic bearing manufactured by the manufacturing method described in claim 1, wherein said shaft base member has a surface on which to mount the recording disk;

an annular rotor magnet mounted on said rotor hub; and

a stator having a plurality of coils arranged in radially opposed relation to the peripheral surface of said rotor magnet.

[Claim 27] A spindle motor for rotating a recording disk, comprising:

a fluid dynamic bearing manufactured by the manufacturing method described in claim 10, wherein said shaft base member has a surface on which to mount the recording disk;

an annular rotor magnet mounted on said rotor hub; and

a stator having a plurality of coils arranged in radially opposed relation to the peripheral surface of said rotor magnet.

[Claim 28] A spindle motor for rotating a recording disk, comprising:

a fluid dynamic bearing manufactured by the manufacturing method described in claim 1, wherein said shaft base member constitutes at least a part of the housing of a recording disk drive unit;

a rotor hub mounted on said sleeve member;

an annular rotor magnet mounted on said rotor hub; and

a stator having a plurality of coils mounted on said base plate in radially opposed relation to the peripheral surface of said rotor magnet.

[Claim 29] A spindle motor for rotating a recording disk, comprising:

a fluid dynamic bearing manufactured by the manufacturing method described in claim 10, wherein said shaft base member constitutes at least a part of the housing of a recording disk drive unit;

a rotor hub mounted on said sleeve member;

an annular rotor magnet mounted on said rotor hub; and

a stator having a plurality of coils mounted on said base plate in radially opposed relation to the peripheral surface of said rotor magnet.

[Claim 30] A recording disk drive unit comprising:

a means for accessing the information recorded on the recording disk mounted on said rotor hub; and

the spindle motor described in claim 27.

[Claim 31] A recording disk drive unit comprising:

a means for accessing the information recorded on the recording disk mounted on said rotor hub; and

the spindle motor described in claim 29.